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A SCHEME FOR MAPPING THE GEOGRAPHICAL DISTRIBUTION OF VERTEBRATE ANIMALS.

BY MILLER CHRISTY, F.L.S.

1. *Introductory Remarks.*—The following outline of a scheme for the compilation of a comprehensive work on the Geographical Distribution of Vertebrates, to consist of a coloured map to show the distribution of each species, accompanied by descriptive letter-press, was drawn up by me several years ago, at which time I contemplated commencing a work on the distribution of the vertebrate animals inhabiting the Palæarctic region upon the lines herein suggested. Various causes combined to hinder the actual commencement of the work, and now I regret to find that my leisure promises to prove insufficient to allow of my carrying it out for some time to come. Under these circumstances, as this mere outline of my scheme involved a good deal of thinking out, and as it may contain ideas useful to others (especially to those undertaking monographs of genera or families), I have, with the approval of the Editor, thought well to print it in 'The Zoologist,' though I do not claim for my ideas any great originality.

In brief, my scheme aimed at supplying a map for each species, showing, by means of different colours, in considerable detail, and with the nearest possible approach to accuracy, the following points for each species:—

- (a). Its present (indigenous) area of permanent residence throughout the world;

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- (b). Its summer and winter ranges throughout the world (if migratory);
- (c). Its relative abundance in different parts of its area;
- (d). Its lines of migration (if any);
- (e). The additional area (if any) over which any species, now partly or wholly extinct, can be traced within historic times;
- (f). The additional area (if any) over which it has been naturalized by human agency; and
- (g). Many other points of interest, such as isolated occurrences,* erratic movements,† areas of hybridization,‡ &c., &c.

The interest and value attaching to such a work, if properly carried out, must be at once apparent to any one acquainted with the subject. Geographical Distribution is a key to many very interesting problems in natural science, and a scheme such as this, if perfected, should throw much light on many vexed questions as to the origin of species, and on the value of the distinctions which naturalists have drawn between what we are accustomed to regard as "good" or "bad" species. It should show, to some extent at least, the causes which have separated, or are separating, species, whether those causes of separation are deep seas, mountain ranges, variations of temperature, or other physical facts; while similar remarks apply to sub-species (those incipient and partially-differentiated species to which "trinomial" names are now applied). The careful mapping-out of the distribution of these latter forms should throw some light on the physical causes which are separating

* I refer here more especially to such isolated and exceptional occurrences as those discussed by Mr. J. J. Dalglish in his "List of Occurrences of North American Birds in Europe" (Bull. Nutt. Orn. Club, vol. v. 1880, pp. 65—74, 141—150, and 210—221).

† By this term, I mean such movements as those occasionally performed by *Syrnhaptes paradoxus* and *Lemmus norvegicus*, which are not regular or seasonal, and are therefore quite distinct from migration proper.

‡ For instance, of *Corvus cornix* and *C. corone* and of *Lanius excubitor* and *L. major* in Western Siberia; also of *Colaptes auratus* and *C. mexicanus*, and many other species, in North America. In most cases, areas of hybridization will be found at the dividing line between the breeding grounds of a species and one of its own sub-species; but this is by no means always the case, as may be seen on reference to Monsieur Suchetet's 'Les Oiseaux hybrides rencontrés à l'état sauvage.'

them from the parent species, and which will in time so differentiate them, by developing their peculiarities, that they may fairly be regarded as distinct species, though opinions will always differ as to the point at which this separation may be considered to have taken place. These and many other interesting points which might be elucidated by the successful carrying out of the following scheme, will readily occur to the reader.

The present is, I think, a very opportune time for undertaking the work, which may be said to have long been "in the air"; yet it may be doubted whether, until the last few years, the information available has been sufficient to admit of its accomplishment with anything like completeness.

It will be obvious that the value of any such scheme as that herein sketched out will depend almost entirely upon its accuracy, and that, as the work progresses towards absolute completeness (though this is, of course, practically unattainable), the value will increase in a still more rapidly increasing ratio; for, in any such scheme, there would be comparatively little value in the details, or in full information from a restricted area, or in the complete mapping of the distribution of a few species only throughout the world; but considerable value would attach to such broad generalizations as might be drawn from the carrying out of a comprehensive scheme of the kind. Thus a series of maps, showing the distribution of all species inhabiting any country having political boundaries (let us take France for example), within that country only, would be so incomplete as to have but little value, except as a small contribution to a vastly larger scheme. Any such work, if undertaken with the idea that it was an end in itself, would merely show the absurdly parochial view which is still so often taken of the study of natural science. If the work were extended so as to show the distribution of French species, not only in France, but throughout the world, it would at once be placed on a more natural and rational basis; but we seem scarcely to reach a stage of even approximate completeness, from a natural point of view, until we have fully mapped out the distribution throughout the world of all the species inhabiting any one of the great natural regions (the Palearctic, for example) into which naturalists have divided the world. It seems to me that these broad generalizations, on which

(as already stated) almost the whole value of any such scheme would depend, could hardly be drawn from any more restricted plan than this. Hence it was that my original intention was to treat only those species inhabiting the Palæarctic region. The mapping of the distribution of all known species throughout the world is, of course, the ideal scheme to aim at, and the only one which could be regarded as absolutely complete; but this would be such a gigantic task that no one person could be expected to undertake it.

2. *Bibliography*.—The first step necessary is the compilation of a topographical catalogue, or bibliography, of all published sources of information which treat of the geographical distribution of any species in any part of the world. It would be a great convenience, and would save a large amount of space in the body of the work, if the entries in this catalogue (which should ultimately form an Appendix) were numbered consecutively, and if reference were made to the authorities quoted, by giving first the name of the authority, followed by the number appended to his particular work, or article, in the Bibliography, with the number of the volume (if the work consists of more than one) and the page, as is done in my 'Birds of Essex' and many other modern scientific works. Thus:—"It abounds throughout northern Africa during winter (Gurney, 294, ii. 381)."

The compilation of this Bibliography, though nominally the first part of the work to be undertaken, would in reality be largely completed (if not mainly gathered) during the progress of the main portion of the work.

3. *Maps*.—The second step should be the preparation of a suitable uncoloured map of the world on which to indicate the distribution of each species. This should, of course, be on Mercator's projection. A convenient size (at least for working purposes) would be "royal broadside" (20 × 25 inches). This would show the British Islands about $3\frac{1}{2}$ inches in length, which would, I think, be sufficiently large for all practical purposes. The maps used in the completed work, when published, might be much smaller. The map should show the main political divisions, the chief towns and cities, general ocean depths, all the principal rivers and mountain ranges, with perhaps a few other physical details. The political divisions would be found useful when entering the information on the map, as most existing mono-

graphs and local lists of species take note chiefly of political (rather than natural) areas.

Certain special maps, which may be called "Key Maps," would be also necessary, and these are noticed hereafter.

4. *Mapping out the Distribution of Species.*—The exact distribution of any species having been more or less precisely ascertained from published or other sources, and copies of the map of the world being ready, the next matter obviously is to portray the area inhabited by the species in question on one of the maps, in order that its distribution, the world over, and the more important facts connected with, or influencing, its distribution, may be shown cartographically at a glance, as already explained.

Birds, in consequence of their power of migration, will obviously require a much more detailed scheme of mapping, in order adequately to represent the geographical distribution of the various species, than any other division of vertebrate animals will require, except perhaps the Fishes. In no other class of the vertebrate animals do we meet with anything corresponding with migration among birds, in the same sense and to the same extent. In the case of Birds, it is necessary to portray both their summer and winter distribution, as well as the lines of migration in both spring and autumn (often different), and the spots outside the ordinary range of the species at which individuals have occurred as accidental stragglers—a point which (though comparatively trivial when a single or a few species only are under consideration) becomes of some importance in a comprehensive scheme like the present, as indicating former or at present unsuspected lines of migration.

The Geographical Distribution of birds being, therefore, more complicated and more difficult to represent pictorially upon a map than the distribution of any other class of vertebrate animals, the following scheme has been drawn up specially with reference to the class Aves; but it will be found, I believe, that there is no fact in connection with the geographical distribution of either the Mammals or Reptiles (and probably none connected with that of the Fishes) which is not capable of being readily indicated by a partial or simplified use of this scheme.

RULES FOR MAPPING (BIRDS ESPECIALLY).

(a). *Red* indicates the area throughout which the species is a *summer visitor* (i. e. that over which it breeds).

(b). *Blue* indicates the area over which it is a *winter visitor*.

(c). *Purple* (i. e. blue printed over red*) indicates the area over which it is a *permanent resident* (i. e. over which it both breeds and winters). Partial inter-migration of the species within this area might be indicated by lighter shades of colour, though this would be somewhat difficult.

(d). These *colours*, indicating the period of residence over certain areas, should be also used in conjunction with the various other indications of distribution mentioned hereafter (region over which the species has become extinct, or has been naturalized, its line of migration, present evident changing of distribution, probable (but unrecorded) extensions of its area, &c., &c.), as more fully pointed out hereafter.

(e). *The lines of Migration* along which the species passes to or from its summer or winter resorts, as the case may be, should be represented, so far as they are known, by means of arrows indicating the general route and direction of migration. As, in the case of some species, a route is followed in the spring migration which is different from that followed in the autumn migration, *red* arrows would indicate the route by which a species *proceeds* to its summer haunts, while *blue* arrows would indicate that by which it *returns* to its winter resorts.†

(f). *Relative abundance* of the species, or the reverse, may be indicated as follows:—An unbroken patch of colouring would show the area over which a species is fairly or very abundant; the area over which a species is of occasional, though more or less regular, occurrence can be shown by a number of asterisks placed in regular pattern thus:—

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while isolated and altogether exceptional occurrences can be indicated by isolated asterisks (thus *), the date of each occurrence being affixed, if thought desirable. In each case, of course, the colour of the asterisks or other marks used would indicate whether the relative abundance over

* Thus all the facts connected with the distribution of any species as specified herein may be represented by the use of only two colours (of course, excepting black), which will effect a great saving of expense in the ultimate printing of the intended work for publication.

† The "erratic movements" referred to on p. 362, though distinct from true migration, might also, for convenience, be represented by arrows.

certain areas were during the winter or the summer; if during both, asterisks of both colours would, of course, be used. In the case of isolated occurrences of a species beyond its known range, it would sometimes be difficult to decide whether it should be entered as in summer or in winter. The time of year would often be an inefficient guide, so that in each individual case probabilities alone could be relied upon.

(g). *Uncertainty as to the boundaries* of the area occupied by any species, in cases where, although there are no actual records, it probably occurs over a wider district than is proved to be the case, may be indicated by marks of interrogation placed close together, in regular pattern covering the region in question as in the case of the asterisks above mentioned; the colour, of course, indicating whether the species may be expected to inhabit the conjectural area during the summer or the winter. For instance, in the case of two or more adjacent, but disconnected, areas being shown for one species, without there being any apparent cause for, or actual information respecting, its absence in the intervening space or spaces, it is a reasonable conjecture that the species in question really inhabits, but has not been actually recorded for, the intervening region or regions; and the marking above described may well be used to indicate this probability, until actual information is obtained.

(h). The area over which it is known that any species has become extinct through natural causes within historic times, or has been exterminated by human agency, may be readily shown by covering the region with parallel *perpendicular* lines, their colour of course indicating whether the species in question is believed to have been a summer visitor, a winter visitor, or a permanent resident in this region. On the other hand:—

(j). The area over which it is known that any species has been naturalized by human agency, more or less, within historic times may be readily shown by covering the region with parallel *horizontal* lines, their colour, again, of course indicating whether the species in question inhabits the particular region as a summer visitor, a winter visitor, or a permanent resident. In some cases it might be desirable to show the rate at which this naturalization of a species has been extended.* This could easily be done by means of fine lines, like isotherms of temperature, which might each be dated, if desired.

5. *Generic Maps.*—In addition to the maps indicating the geographical distribution of *species*, it is desirable also to have a series of maps showing the geographical distribution of

* Such, for instance, as the spread of *Passer domesticus* over North America, of *Lepus cuniculus* over Australia, and (to select an example from among the plants) of *Elodea canadensis* over Britain.

genera. These generic maps could be easily compiled from the specific maps, when completed. They would probably throw some light on the value of the generic distinctions which have been based mainly on anatomical structure. In the case of these maps, it would be sufficient to indicate by means of one colour the entire area covered by a genus as represented by any of its species, either in summer or winter. The distinction between the haunts of the different species belonging to the genus in question at different times of the year is, for this purpose, of no importance whatever. Similar maps, showing the distribution of families and orders, might also be prepared, and would certainly prove interesting.

6. *Key Maps*.—In addition to the foregoing maps it is desirable (as already stated) to have certain other maps which may be called "Key Maps," representing the various chief natural forces and physical facts which have any effect on the distribution of animals, or which govern their migrations. They should, in the first instance, be plain uncoloured maps, exactly similar to those used in marking out distribution, but they should be printed on some *transparent* paper, such as tracing-paper. They should ultimately, for use, be coloured by hand, in such a manner that each one shows the existence and influence over the surface of the world of some one physical or natural force. Thus, one key map would indicate the elevation of the surface; another, the prevailing ocean currents; another, ocean depths and ancient coast lines; others, the prevailing wind currents at different times of the year; others, the chief mountain ranges and river systems of the world, rainfall, slope exposure, distribution of forest, hygrometry, geological formations, &c., &c. When so coloured, these maps might be taken in turn and laid over each completed map showing the distribution of any particular species. By this means, a more or less clear idea might be obtained of the effect which the various physical facts and causes shown on the different key maps have had on the distribution of the species in question; for the distribution of the species would be seen through the transparent maps showing the various physical forces, and a careful comparative examination would probably to some extent show the correlation of the two, or, in other words, what effect the latter had upon the former.

THE "RUSSET-PATED CHOUGH" OF SHAKESPEARE.

BY H. A. EVANS.

EVER since I learnt from the late F. A. Marshall's note on this passage, in the 'Henry Irving Shakespeare' (vol. ii. p. 377), that there was authority for interpreting the word *russet* as = *gray*, I had ceased to feel any misgivings about the "russet-pated Chough," believing that the question was thus settled in favour of the Jackdaw. Every other consideration, as I shall attempt to show, is strongly in favour of this identification, and though I do not think that Professor Newton has proved his point in the last number of 'The Zoologist' (p. 368), I admit that he touches the weakest point in his opponent's case when he challenges proof that in Shakespeare's time *gray* was one of the accepted meanings of this word *russet*.

(1). There can be no doubt that the commonest meaning of the word in Elizabethan literature is its etymological one, i.e. *reddish*, or *reddish-brown*; see, for instance, Gerard's use of it—a writer whose special business it was to be exact in his descriptions of colour. But, from the frequent mention of *gray russet*, we may infer that the colour of the coarse woollen cloth, which at least as early as 'Piers the Plowman' ("Thus robed in russett ich romede a-boute," *Passus*, xi. 1) formed the ordinary dress of the peasantry, though possibly sometimes brownish, as the name implies, was as a matter of fact most commonly gray; and I think the Editor has found the key to the difficulty when he suggests (September number, p. 334) "that many probably derived their sense of the colour termed 'russet' from the material." The word would thus come to be used alone to denote a gray colour, just as we now-a-days may talk of "chocolate cloth," "olive morocco," "orange velvet," instead of "chocolate-brown," "olive-green." If this be so, Shakespeare, in using the term "russet," may habitually have associated it with the *gray* material, rather than that of any another colour. Unfortunately our evidence on this point is of the scantiest: he uses the word only thrice; once of the stuff figuratively—a passage which does not help us, once in the passage under discussion, and once in 'Hamlet' (Act i. sc. 1):—

"But, look, the morn in *russet* mantle clad,
Walks o'er the dew of yon high eastward hill."

This is usually interpreted "rosy," but it is obvious that "gray" is equally appropriate, and indeed Mr. Marshall (v. s. vol. viii. p. 96) says:—"Every one who has kept watch out of doors all through the night knows that grey light which is the first precursor of morning, after which comes, if it comes at all, the red and golden colour"; and he proceeds to quote the lines in 'Much Ado about Nothing' (Act v. sc. 3):—

". The gentle day,
Before the wheels of Phœbus round about
Dapples the drowsy east with spots of gray,"

and the line in 'Romeo and Juliet' (Act iii. sc. 5):—

"I'll say yon gray is not the morning's eye."

Such is the evidence; the reader must draw his own conclusion.

I take the following from Fairholt's 'Costume in England' (ed. 1885, vol. ii. p. 354):—

"*Russet*. Reddish-brown or grey . . . Florio, in voce 'Romagnuolo,' describes [the material] as a kind of coarse homespun 'sheepe's *russet* cloth, called frier's cloth, or shepherd's clothing.' Peacham, speaking of countrymen in 1658, says, 'Most of them wear *russet*, and have their shoes well nailed.' *Gray russet* is mentioned in Delony's 'Pleasant Historie of Thomas of Reading' [1612], as the ordinary garb of country-folks; and when Simon's wife, in this tale, complains that 'the London oyster-wives, and the very kitchen-stuffe cryers, doe exceed us in their attire,' her husband tells her, 'We are country-folks, and must keepe ourselves in good compasse; *gray russet* and good hempe-spun cloth doth best become us.' In the ballad of a 'Courtier and Country Clown,' in Durfey's collection, the latter says:—

'Your clothes are made of silk and sattin,
And ours are made of good sheep's grey.'

'In *homely gray*, instead of bisse [bice] and purest palle,
Now all thy clothing must be.'

Patient Grissel, 1619."

In connexion with his contention that *russet* is equivalent to *gray*, Mr. Marshall, in the note on the present passage above referred to, directs attention to two long notes of his on the subject in 'Notes and Queries' (6th series, vol. ix. pp. 345, 470), to a note by Professor Newton in the same volume (p. 396), and to another by Mr. W. Aldis Wright, withdrawing his adoption of Prof. Newton's view (vol. x. p. 499), and continues, "Of the passages

proving that *russet* = *gray*, it will be sufficient to quote Cotgrave [1611], who gives under '*Gris*: *gray*, *light-russet*, *grizle*, *ash-coloured*,' &c."

In Mr. Marshall's first communication to 'Notes and Queries' (vol. ix. p. 345), he says:—"That Shakespeare in this passage meant the Jackdaw I think there can be very little doubt. In fact, I doubt very much if the word 'Chough' is ever used by Shakespeare for anything but Jackdaw. Certainly, in the well-known passage in 'Lear,' 'the crows and choughs that wing the midway air' (iv. 6), there is some reason for thinking that Shakespeare meant red-legged crows; for that this bird was found on Dover Cliff at a period later than Shakespeare's time we know on the evidence of Pennant, quoted by Yarrell, who gives Beachy Head and the Isle of Wight as localities. But there is no reason why 'Chough' should not mean 'Jackdaw' even in that passage; for there must have been plenty of Jackdaws on Dover Cliff in the time of Shakespeare, and there might not have been any red-legged crows there at all. Had he applied the epithet 'red-legged' to Choughs in any of the passages in which the word occurs we should have known that he meant the Cornish Chough." After specifying the passages referred to, he concludes:—"I think there can be no reasonable doubt that, in all these passages, by 'Chough' Shakespeare means the Jackdaw, and not the red-legged Crow."

In Mr. Marshall's second communication to 'Notes and Queries' (vol. ix. p. 470), after acknowledging the perusal of Prof. Newton's view (*tom. cit.* p. 396), he remarks:—"With all due respect, I must entirely repudiate such a reading as *russet-patted*. In the first place, there is no such word as *patted*, and I do not believe that Shakespeare would have invented it for this occasion, as it was utterly unnecessary to do so. In the next place, under no possible circumstances could *russet-patted* fairly be held to be a synonym for *red-legged*." He proceeds to give some instances of the use of the word *russet* in the sense of *gray*, amongst others the following:—

"And al-so glad of a gounne of *grey russet*."

Piers Plowman, p. 280 [C. Passus, xvii. 298].

And

"Also aboute thys tyme the gray Fryers were compelled to take theyr old habit *russet* as the shepe doth dye it."

Fabyan's Chronicle, p. 687.

And he concludes:—"I think these quotations perfectly justify my suggestion that *russet* might apply to the gray colour of the Jackdaw's head; but that it ever could apply to the bright red of the Cornish Chough's legs and feet, they seem to me—if language has any meaning—absolutely to forbid. Finally, let me say that a reconsideration of all the passages in Shakespeare in which *Chough* occurs confirms me in the belief that it never meant anything else but *Jackdaw*. In all the other passages Jackdaw suits the sense much better than the Cornish Chough would."

(2). Both the Editor and Professor Newton write under the impression that the word "pated" occurs in Shakespeare but once, and the latter rests upon this as an argument in favour of the conjecture "patted." I say nothing of the fact that all the six "old editions" agree in reading "pated," but the case is considerably strengthened when we take into account the fact that Shakespeare uses "pated" *five* times in addition to the passage under discussion. These are:—*bald-pated*, 'Measure for Measure,' v. 1; *crooked-pated*, 'As You Like It,' iii. 2; *knotty-pated* and *not-pated*, 'Henry IV.,' Pt. 1, ii. 4; and *periwig-pated*, 'Hamlet,' iii. 2. With regard to another point raised by Professor Newton, I confess that, in the face of such Shakespearian expressions as "hoary-headed," "long-legged," "loose-bodied," "big-bellied," "fat-brained," "lily-livered," &c., I do not understand him when he writes ("with deference," it is true), "it was not the custom in Shakespeare's time, as it has since become, to coin an adjective in form of a participle from a purely English noun."

(3). Even assuming that Shakespeare could have been guilty of such a gallicism as "patted" for "legged" or "footed," there is no proof—is there even any probability?—that, inland-bred as he was, he was familiar enough with the Cornish Chough and its habits to include whole flocks of them ("many in sort") among the quarry pursued by "the creeping fowler." Of the six other passages in the plays in which the word *Chough* occurs, there is only one—the famous description of Dover cliff in 'King Lear'—which raises the slightest presumption that the Cornish Chough is intended, and here we are equally at liberty to adopt Mr. Marshall's view, and understand the birds in question to be Daws, as are most undoubtedly the "Choughs" which may be seen any day "winging the midway air" along the cliffs of Bideford Bay.

"Flocks of wild-geese" were doubtless frequently to be met

with in those days in the undrained marshy tracts throughout the country, and the editor of the fourth edition of Yarrell informs us (vol. ii. p. 252)—though on what grounds is not evident—that the Cornish Chough “apparently frequented a good many inland localities in former times.” It would be interesting to know what evidence there is as to the inland distribution of this species in England.

In reply to Professor Newton's fifth position (p. 393), no more need be said until his view is established on other grounds; meanwhile we must be content to regard the epithet “russet-pated” as one of those descriptive touches which we find again in the “long-legged spinner,” the “red-hipped humble bee,” and the “shard-borne beetle.”

MEMOIR OF THE REV. LEONARD BLOMEFIELD, M.A., F.L.S.

A VENERABLE link with a past generation of naturalists is severed by the death of the Rev. Leonard Blomefield, better known as Leonard Jenyns, who died at Bath on the 1st September last, at the advanced age of ninety-three. A contemporary and friend of Yarrell, Selby, Dean Buckland, Dr. Gray, Bell, Darwin, Westwood, and other well-known zoologists, a friend also of the Professors of Botany, Daubeny and Henslow (for he was also a botanist of some ability), he lived to see all these pass away, and to become acquainted one by one with the new generation of zoologists springing up around him, many of whom were not born when he wrote and published his ‘Manual of British Vertebrate Animals’ in 1836. He used to say that the earliest occurrence in his life which he could recollect was the funeral of Lord Nelson, which took place in January, 1806, when he was between five and six years old. He remembered coloured pictures of the funeral procession being sold in the streets, and some of them being brought up to the nursery for the edification of the children of whom he was one.

His father was the Rev. George Jenyns, who on the decease of a second cousin, Soame Jenyns, came into possession of some property in Cambridgeshire known as Bottisham Hall. It was here that his early life was spent; although he was born in London, in Pall Mall, at the house of his maternal grandfather,

Dr. Heberden, a well-known physician of the day. His father's London house, however, was in Connaught Place, from whence, in April, 1809, he went to school at Putney, and Connaught Place at this date was the last street in London west of Oxford Street and the Edgware Road—all beyond being open country and green fields!

After the usual preliminary schooling in Latin and Greek at Putney, he proceeded to Eton in 1813, where, having no inclination for games or sports, he spent his play hours in wandering by himself in the green lanes that skirted the "playing fields" looking after stag-beetles, and watching birds. In after life he expressed the conviction that he had derived his taste for Natural History from his uncle, Mr. Chappelow, who was also his godfather, and a good naturalist.

Neither at Eton, nor subsequently at Cambridge, did he manifest much inclination for either classics or mathematics, but being nevertheless of a studious disposition, he took more delight in reading books of travel and natural history, and was naturally much impressed with White's 'Selborne,' which he borrowed from a schoolfellow at Eton, and, fearing that he might never see the book again, actually copied out nearly the whole of it, omitting only a few chapters which were of less interest in a natural-history point of view. This MS. he kept for years, having little idea at that time of becoming the owner of numerous editions of the work, still less of becoming one day the editor of one of them.

Having determined at an early age that his profession was to be the Church, he never altered his mind, and on the very day of his attaining the age of twenty-three, he was ordained to the curacy of Swaffham Bulbeck, in Cambridgeshire, a parish close to his father's property. He began parish work by taking two full services on the Sunday following, and the manner of his induction was somewhat remarkable. The Vicar of the parish, whose curate he was to be, kept a school in the neighbourhood of Wisbeach, and had never been in the parish of Swaffham Bulbeck since the day he read himself in. More oddly still, he gave Mr. Jenyns the appointment without any interview, and the latter never saw him, his own Vicar, till shortly before his death—twenty years afterwards!

The Vicar, however, resigned in five years, and the Bishop of

Ely gave the living to the Curate. Considering himself then a fixture, Mr. Jenyns enlarged the Vicarage house, made a garden, and planted trees and shrubs. From the front windows there was a pretty view of the Bottisham woods and plantations not far off; while the fens out of view, but within a walk, as also Newmarket Heath and the Devil's Ditch afforded rich ground for Natural History pursuits. Here Mr. Jenyns resided for thirty years, and only resigned his living in consequence of his wife's health, which obliged him, acting under the advice of Sir Benjamin Brodie, to move her to the south of England. After eight months spent at Ventnor, in the Isle of Wight, he removed to Bath, where he continued to reside until his death. His first wife, whom he married in 1844, was a niece of Dr. Charles Daubeny, the well-known Oxford Professor of Botany. His second wife, in 1862, was the eldest daughter of the Rev. Robert Hawthorne, for some years curate of Swaffham Prior, the adjoining parish to his own.

While yet quite a young man, reflecting on his father's occupations and pursuits, and having made up his mind to enter the church, there were four things which he determined to have nothing to do with—not so much from their incompatibility with church ministerial work, as from his personal distaste to some of them, and the fear that they might distract his attention too much from parish duties—these were sporting, farming, politics, and magisterial business. Although his father and two brothers were keen sportsmen, having frequent shooting parties during the season at Bottisham, where the game was purposely preserved, he never fired off a gun in his life, not even when desiring to secure some bird for his collection or for identification. These, if wanted, were shot for him by his brother or by the keeper. He was always fond of studying the habits of birds in their proper haunts, and Cambridgeshire being for the most part open country, such species as like shelter naturally flocked to the plantations round his house, where he had ample opportunities of becoming acquainted with their notes, nature of their food, nidification, and so forth. The smaller summer birds of passage came there in numbers, and he thus became familiar with the nests and eggs of all the species that remained to breed.

He formed a collection, also, of insects of all orders which he could find in Cambridgeshire, paying special attention to the *Diptera*, which in those days were much neglected by entomolo-

gists. This collection he subsequently presented to the Museum of the Cambridge Philosophical Society, of which Society, which he joined in 1822, he was one of the most active members. His collection of British Birds' eggs, together with a series of crania of the smaller mammalia, he gave to the Museum at Ipswich. His British Land and Freshwater Shells, of which he had a tolerably complete collection, and his Herbarium he took with him to Bath.

There was one group of shells, the small fresh-water bivalves *Cyclas* and *Pisidium*, to which he paid particular attention. On this group, after long study of their characters and habits, as observed in specimens kept alive in water for many months, thriving and breeding freely, he wrote an excellent monograph, with plates by Sowerby, which was published in the fourth volume of the 'Transactions of the Cambridge Philosophical Society.'

But his two most important works were his 'Manual of British Vertebrate Animals' and his 'Account of the Fishes collected during the Voyage of the 'Beagle.' The former, containing accurate descriptions and measurements of the species included, together with condensed remarks on their habits, forms a good text-book even at the present day, making due allowance for the progress of Zoology during the fifty odd years which have elapsed since its publication. The latter work he was specially invited to undertake by Darwin, who could find no one else willing to attempt it. Regard for his old friend, and the interest he took in all the valuable results of his celebrated voyage, induced him to comply. But the work cost him a good deal of labour, inasmuch as he had no previous acquaintance with exotic species, and had thoroughly to master the first volume (on the structure of Fishes) of Cuvier and Valenciennes' great work, the 'Histoire des Poissons,' before he felt qualified to determine the species collected by Darwin, and describe such as were new.

In 1846 he published an octavo volume entitled 'Observations in Natural History, with an Introduction on Habits of Observing, and a Calendar of Periodic Phenomena in Natural History'; and in 1858 appeared his 'Observations in Meteorology.' In addition to these separately published works, he contributed a number of scientific papers to the 'Transactions' of various Societies, a list of which will be found appended to a pamphlet entitled 'Chapters in my Life' which he printed a few years ago "for private

circulation" amongst his friends. From this *brochure* we have derived much of our information respecting the earlier years of his life. For the last twenty-five years it has been our privilege to know and to correspond with him, having made his acquaintance in 1868, while on a visit to Bath. Our first meeting was in the Library of the Bath Literary Institution, and we well remember being struck with his personal appearance. He was a tall, spare man, clean-shaved, and, even at that date, with white hair, which he wore rather long. His features were pleasing, and his affable manner that of a refined gentleman of the old school. One had not to converse long with him before discovering that, in matters zoological at all events, he was not only communicative but well-informed; and it afterwards became a subject for mutual regret that the distance which separated us precluded our meeting oftener.

As he advanced in years his journeys to London naturally became less frequent, until at length his great age altogether precluded his leaving home. But he was still actively interested in the Bath Natural History and Antiquarian Field Club, which he founded in Feb. 1855, and to whose 'Proceedings' he continued to contribute almost to the last. In Nov. 1891, when in his ninety-second year, he read before this Society a paper entitled "Remarks on the Distribution and Movements of British Animals and Plants in past and present times, as instanced in the Nightingale and some other cases."*

He presented the whole of the scientific portion of his library (1200 vols.) to the Bath Literary Institution, as well as his entire Herbarium of British Plants in forty folio volumes. A special room was designed for their reception, and the so-called "Jenyns Library" is now an important feature of the building.

He assumed the name of Blomefield in 1871, on succeeding to the property of Francis Blomefield, the historian of Norfolk, whose sister had married a great-uncle of his.

He was an *original* member of three Societies, the Zoological (1826), the Entomological (1834), and the Ray Society (1844), and at the date of his death was the oldest Fellow of the Linnean Society, having been elected in 1822, the same year in which he became a member of the Cambridge Philosophical Society. He

* Proc. Bath Nat. Hist. and Antiq. Field Club, vol. vii. pp. 185—199.

joined the British Association in the second year of its existence in 1832, and at its Edinburgh meeting in 1834 read a valuable Report upon the progress of Zoology.

In November, 1892, the Council of the Linnean Society, recognizing the fact that Mr. Blomefield had been a Fellow of the Society for seventy years, caused an Address to be drawn up and illuminated on vellum, which was numerously signed, and forwarded by the Librarian for Mr. Blomefield's acceptance. It was worded as follows:—

"To the Rev. LEONARD BLOMEFIELD, of Belmont, Bath, M.A., F.L.S.

We the undersigned Fellows of the Linnean Society of London, on the 17th day of November, 1892, in General Meeting assembled, desire to congratulate you, as "The Father of the Society," on the occasion of your attaining the seventieth anniversary of your election, an event unprecedented in the annals of this or perhaps of any other Society. We desire to record our gratification on learning that, at the advanced age of ninety-two years, you still retain a vivid interest in that branch of science of which during an exceptionally long career, both by precept and example, you have been so able an exponent, and we cordially express the hope that so worthy a life may be long spared."

Here followed a long list of signatures of those who were present at the meeting, supplemented by the signatures of several others who had been unable to attend.

Mr. Blomefield's reply, addressed to the Librarian, was as follows:—

"Belmont, Bath,
Nov. 22, 1892.

"MY DEAR Mr. HARTING,

Thank you very much for your letter received on Saturday, and yet more for the very valuable congratulatory address from the Members of the Linnean Society generally, which came safe to hand yesterday evening. In respect to this last, I hardly know in what terms to make any adequate reply, or therein to express what I feel in the way of gratitude and thankfulness for so high a mark of esteem on the part of the Society, with which I have had so little intercourse for a long time back.

"True it is that my connexion with the Society, so far as membership goes, has now lasted for the long term of seventy years, longer perhaps than in the case of any other member; but it grieves me to think how little I have done personally for the interests of the Society, how trifling the contributions I have formerly made to its publications. When I open and

inspect the Journals which it puts forth from time to time (still so liberally sent to me as they appear), and see the valuable work being done by others, often most elaborate researches into the minute structure of the lower forms of animal and vegetable life, my own doings in Zoology and Botany, fond as I am of the subject even now in extreme old age, seem as nothing.

"Yet the retrospect is not without other reminiscences of a more pleasurable character. It brings back to my recollection departed friends whose names may be found in the older lists of the Society, with some of whom I joined in the pursuits that gave us so much pleasure, but who have long since been called to their rest. I as yet remain; if I cannot claim acquaintance with many of the Fellows of the present day, I shall always hold in grateful remembrance those who were instrumental in getting up the Congratulatory Address just received, which shall always have a place on the walls of my study, whereon there are several portraits of old Linnean Society members, including that of Mr. Macleay (the father of Alexander Macleay), who was, if I remember right, Secretary to the Society on the evening on which I was admitted, Mr. Lambert, V.P., being in the Chair.

"Once more expressing my gratitude for the great honour that has been done me,

Believe me, dear Mr. Harting,

Sincerely yours,

LEONARD BLOMEFIELD."

This was the last letter received; and, having regard to its length and to the firm character of the handwriting, it is a remarkable one for a writer then in his ninety-third year. In less than twelve months from the date of it, he was called to his rest; but he has left behind him an imperishable name in the annals of English Zoology.

His life furnishes an excellent example of the good that may be done by a country vicar by encouraging those about him to use their powers of observation, and find a pleasure in contemplating and studying the various forms of animal and plant life by which they may happen to be surrounded. The books and papers which he published, the lectures which he delivered, the Field Club which he founded, all tended in this direction—the encouragement of the study of Natural History—and when we consider the number of years over which his labours extended, it must be admitted that in this particular line he has rendered considerable service to science.

An observation of his own is worth repeating here, as a piece of good advice to young naturalists, and as a fitting conclusion to this imperfect memoir. In 1889 he wrote:—"Darwin once, in a letter to me, expressed his surprise that with all my parish work and church duties to attend to, I was able to do so much in Natural History. The secret of the matter lay simply in a well-considered arrangement of time and occupations. I was always an early riser, seldom, unless indisposed by illness, getting up later than six o'clock till past four score years. I had also contracted a habit of turning all leisure hours and half-hours to good account and (what I consider of much importance in all work requiring time and thought), never attempting two things at once, but for so long as circumstances allowed, throwing my whole mind into whatever I was engaged upon as if there was nothing else to attend to; in accordance with the scriptural maxim—'Whatever thy hand findeth to do, do it with all thy might.'"

ON THE DISTRIBUTION AND HABITS OF THE PIED FLYCATCHER IN WALES.

By E. A. SWAINSON.

HAVING lived for ten years in the midst of one of the chief Welsh haunts of the Pied Flycatcher (*Muscicapa atricapilla*), it has occurred to me that so far as Wales is concerned, this bird has been rather overlooked in works on British ornithology, and that more details on the subject would be of interest. Most of the books describe it as occurring in a few places in North Wales, while Central Wales, where it is probably as common as in any part of the kingdom, is but briefly alluded to. In reply to a request for information, which the editor of 'The Field' was kind enough to publish for me, I received letters from several observers, bringing to light some fresh localities where this bird passes the summer, or has accidentally occurred; and I am now able to add two more counties—Cardigan and Montgomery—to the six from which it had been before recorded. I propose to bring together the notes kindly sent me by correspondents, and to make a summary of the already published matter on the subject, also to add some of my own notes on its habits in Breconshire.

The home of the Pied Flycatcher in Wales appears to be the long mountainous tract reaching from Snowdon to the Brecon Beacons; but even here it is local, and only plentiful in the high-lying valleys at an elevation of from four hundred to a thousand feet above sea-level. It has a liking for the proximity of a fast-running, rocky stream, and the presence of old trees, especially oaks on account of the nesting sites they afford by reason of their holes and fissures, is a desideratum. These conditions are found here and there, but generally in remote, unfrequented districts. In such localities in Breconshire a diligent search will often reveal the presence of this bird, and it is probable that it spends the summer in many places in Central Wales unnoticed. Its migratory instinct is peculiar, and for some hidden reason it presses on to the mountain-side valleys to find a summer home, disregarding during its long flight other apparently suitable spots. A correspondent, in sending me some notes about its habits in the Elan valley, Radnorshire, writes as follows:—"To me it has always been a wonder how these migrants ever reach localities such as I have described. This valley, for instance, is practically surrounded by mountains of extensive moorland; not that this fact would present any difficulty to them in itself, but whence do they gain the knowledge that there are isolated spots suitable to their requirements?"

I propose here to deal with the eight counties from which this bird has been reported, commencing with the north.

DENBIGHSHIRE.—A pair nested at Hendre House in 1843-4 (Annals and Mag. Nat. History, 1845). The fact of its nesting in the county was also recorded in 'The Field' in 1871.

MERIONETHSHIRE.—In 1872, and in previous years, it nested at Llandderfel (Harting's 'Our Summer Migrants'). Mr. F. H. Birley, in 1885, found it by no means rare about two miles south of Cader Idris, and discovered six of its nests ('The Zoologist,' 1886, p. 75). Mr. A. B. Priestley, writing from Cae Ddafydd, in the north-west of the county, informs me that "Pied Flycatchers are quite common here now; in saying this I mean that they are of more or less recent introduction to one's notice here. I question if I saw many of them much before 1870; after that date they have become commoner every year I think, and we have now annually considerable numbers of them in the breeding season." Mr. F. C. Rawlings, of Barmouth, has informed me

that it is tolerably plentiful in certain localities in his neighbourhood, and that several nests have been found.

MONTGOMERYSHIRE.—Mr. C. H. L. Ewen writes to say that in 1888 or '89 he found two of its nests, in holes of trees,—one in a birch and the other in an oak—close to the river Cowny, about one mile and a half south of Lake Vyrnwy; and that he saw at least three pairs of these birds, which he generally discovered by hearing their song. A friend of Mr. Ewen's, who was with him when the nests were found, writes to say that each contained six eggs, and that he has often seen this bird in the county. A letter in 'The Field' of Oct. 15th, 1892, from Mr. Alfred George, states that he has twice noted it near Meifod in twenty-six years, and that on one occasion the nest was found.

CARDIGANSHIRE.—Capt. G. Weir Cosens, Bronpadarn, near Aberystwith, writes to me as follows:—"A Pied Flycatcher was shot in my garden at Cwm, about two miles from Aberystwith, by my gardener, in June, 1877, and was brought to me a few minutes after, when I stuffed it, and it is now in my collection; it was a male and in perfect plumage." He adds that he has never heard of any other instance of its occurrence in the county.

RADNORSHIRE.—Mr. C. Bingham Newland, Killetra, Mallow, informs me by letter that:—"The Pied Flycatcher is not uncommon in the woods, and on the banks of the rivers Elan and Claerven, in the neighbourhood of Nantgwyllt, five miles from Rhayader. In these woods there are a great number of very old pollard oak trees, hollow and full of holes, in which I have found the nest of this bird; and I am strongly of opinion that it is these trees that attract it to this locality, for the purpose of nidification. The male appears to arrive very early in the season, before the leaf is on, and the female later." I have also heard from a bird observer, who formerly lived at Nantgwyllt, that it is rather common there, and that several nests have been found. Under the heading, "The Birds of a Welsh County," a writer in 'Temple Bar,' in the year 1887, states that it is a summer visitant to the west side of the range of hills named Radnor Forest.

BRECONSHIRE.—In this county the chief haunt of the Pied Flycatcher is the district included in the basin of the river Usk, where it is fairly common. This river, with most of its tributaries, is in many parts fringed with old trees, which are an

attraction to this bird, on account of the nesting sites they afford. It occurs, at the rate of one or two pairs to the mile, along the Usk, from Lanthetty to Pant-ys-gallog bridge, a distance of about twenty miles. It is still more frequent on several of the streams running into the main river, such as the Honddhu, Yskir, and Bran, which are much wooded and well suited to its habits. It is also not uncommon in the following woods:—In Fenni Vach, a well-timbered, hilly tract of over a hundred acres, it is found to the extent of about nine or ten pairs. It occurs every year in the Priory Grove, adjoining Brecon; also in the west of the county, in a certain hill-side wood, remarkable as being one of the few remaining Welsh nesting-places of the Kite. No doubt the Pied Flycatcher also occurs in other places in the large woods in the wilder districts. A pair or two generally settle down close to Brecon. In 1889 I several times saw a male bird about the fine trees in the "Captain's Walk," a promenade skirting the town; and a pair come most summers, to a grove of old oaks near my house, and have nested there at least twice.

They arrive in this district about the fourth week in April. Certain spots, well known to trout anglers, are then sure "finds" for this bird. Among these are Dinas Corner, Aberyskir rapids, and the stretch of water above Cwm Ysk. Here, and in other similar spots, the trout-fisher, with an ear for bird music, is pretty sure to recognise the lively song of this little migrant, and perhaps get a glimpse of its striking black-and-white plumage. The song resembles that of the Redstart in duration and frequency of utterance, but it is shriller, and not so loud, and in pitch is nearer to that of the Hedgesparrow. The first three or four notes remind me rather of the spring song of the Coal Tit. I have made several attempts to write it down, and find it varies from time to time. The passages which occur oftenest are:—"Tichee tichee chuck chuck chee," and "Cheety cheety cheety chee."

It nests in holes in trees, generally in oaks, at a height of from ten to twenty feet from the ground. Holes bored by the Great Spotted Woodpecker and Nuthatch are often selected, as well as those formed by decay. Such cavities abound in the well-wooded Usk valley; but other species which nest in holes have also to be provided for, and no doubt the competition for

nesting sites is keen. The nest is easily found by watching the birds, but the eggs are difficult to obtain, owing to the hardness of the wood, and the difficulty in reaching the site. Out of over a dozen nests I have found, I have only been able to obtain eggs from four. Two nests which I took are composed chiefly of honeysuckle bark strips and dead oak leaves. I have examined eggs from five nests, and believe the only ones with which they are likely to be confused are those of the Redstart. On comparing a series of eggs of these two species, I find those of the Redstart are larger, of a deeper blue-green, more glossy and more pear-shaped; those of the Pied Flycatcher being much paler, almost an oval in shape, and with little or no gloss. Eggs from one clutch of seven are very small, and less in size than those of a Wood-warbler. Mr. E. Cambridge Phillips, in his "Birds of Breconshire" ('The Zoologist,' 1881, p. 409), writes:—"This county seems to be a favourite resort of this bird, and I may say with truth that it is fairly plentiful. It has bred in my garden at Vennyvach, and it nests also in several places in and near this town. Ornithologists residing here (and they are very few) agree with me that it is far from rare; and therefore I can only arrive at the pleasant conclusion that, although elsewhere generally considered a scarce bird, this county seems exceptionally favoured." Mr. Alfred Crawshay, writing to me, says that he sees the Pied Flycatcher every spring, about the banks of the Usk near Buckland: that it seems to be fond of alder trees; and one year he noticed a pair of these birds going to feed their young in a nest placed in a hole of a decayed tree.

PEMBROKESHIRE. — Mr. Thomas Dix writes:—"Pied Flycatcher.—Specimens in the collection at Stackpole Court (Mr. Tracey tells me), were killed in the neighbourhood; also that the bird is occasionally seen in the spring and autumn." ('The Zoologist,' 1869. p. 1671).

GLAMORGANSHIRE.—Mr. Digby S. W. Nicholl, writing from The Ham, Cowbridge, says:—"On May 8th, in the grounds adjoining this house, I obtained a male specimen of the Pied Flycatcher. This is, to my knowledge, the only authentic occurrence of this flycatcher in Glamorgan." ('The Zoologist,' 1888, p. 229).

NOTES AND QUERIES.

MAMMALIA.

A Hare with one Ear.—There has just been given to me a very curious Hare, which differs from other Hares in having only one ear. The most careful search failed to discover any traces that there had ever been more than one ear. The place where it ought to have been was perfectly furred over, and although under the skin there was the usual opening in the bone of the skull, no trace of cartilage was to be found there. The animal must have been born with one ear only, or if with both the missing organ must have disappeared at a very early stage in the creature's growth. —ROBERT SERVICE (Maxwelltown, Dumfries).

White Moles.—White Moles are pretty often heard about, but as yet I have not seen one. All the so-called "white" Moles I have met with are really of varying shades of fawn, or pale cream, or buff, sometimes with more or less of a rusty red on snout, and under the breast and throat. I have just seen one of the usual pale yellow, or buff, colour with rusty red spots on nose and along the middle line of the abdomen, which was captured in Rerwick by Mr. John Johnstone, who follows his occupation of mole-catcher there. The specimen is intended for the Observatory Museum collection, and was sent to Mr. Truckell, to whom I am indebted for allowing me to examine it while in the flesh, and also for permitting me to make the following extracts from the letter with which Mr. Johnstone accompanied his present :—"I have never got any pure white Moles—they are all cream, some lighter than others. My father got one on Lothside of Lochrutton about twenty years ago, and he used to remark that it was strange none had been got on that farm since either he or my uncle—I forget which—had got some six of these white Moles about thirty years previously. I got one on Lochside about fifteen years ago, and since then I took two others in that neighbourhood; and I got three, five or six years ago, on Torrs of Auchencairn; and on the farm of Airds on Balcary estate I have taken some ten or twelve in eighteen years, some years two or three, and other years none. I believe there are several farms in Holywood where cream-coloured Moles are got, but I have never wrought there. As regards other varieties than the cream-coloured ones,—I may say that in the cream-coloured Moles the female is always lighter than the male,—I get one or two occasionally on Barcheskie and neighbouring farms with about the size of a sixpence or less of cream-colour on the belly, and a slight tip of the same on the tail. There are some that have the under fur much lighter than the top fur, but my experience is that they are only got in certain

localities like the others—namely, Porterbelly in Kirkgunzeon, and Castlecreavie in Rerwick. The last one of this sort that I got was on Burnside of Mabie." Mr. Johnstone's experience appears to indicate that in certain places these curious varieties may be regularly met with. The district round about Thornhill seems to be quite prolific, for the late Dr. Grierson had over a dozen of them.—ROBERT SERVICE (Maxwelltown, Dumfries).

Albino Squirrel.—It may be worth recording that I received, for preservation, on Sept. 19th, an albino male Squirrel with pink eyes. It was shot on Captain Holford's estate, Westonbirt, near Tetbury, on Sept. 11th. It is not for sale.—H. W. MARSDEN (Bath).

[Albino Squirrels are by no means common. One was killed at Holt, Norfolk, in November, 1885, as noticed in 'The Field' of Dec. 12th in that year. Another was caught by a retriever in a plantation at Gumley, near Market Harborough, as recorded by the Rev. A. Matthews (Zool. 1892, p. 20).—ED.]

Decadence of the Vole Plague in Scotland.—As time goes on, the signs that Voles are being at last reduced to their normal number become increasingly evident. The finest grazing ever produced on the sheep farms in the south of Scotland is on the tracts which were devastated by the Voles. This fact is rather remarkable in view of the statements circulated by the alarmed farmers during the height of the plague. What has regularly happened elsewhere on the cessation of these plagues has now come to pass in the sheep-farm districts above referred to. The birds of prey are starving, and in the case of the Short-eared Owls in particular, dead ones are being found lying about in many places. Mr. McKay, our local birdstuffer, received over a dozen in one week. Some that I found were thoroughly examined, and I failed to see anything but starvation and consequent emaciation to account for death.—ROBERT SERVICE (Maxwelltown, Dumfries).

Whiskered Bat in Scotland.—Writing in the 'Annals of Scottish Natural History' for July last (p. 146), Mr. William Evans reports the capture, on the 20th March last, of an example of *Vespertilio mystacinus* in East Lothian, "on the links about a mile east of Dunbar." It is an interesting addition to the list of Mammalia for the Forth district, and is only the second instance in which this species of bat has been ascertained to have occurred in Scotland. The first recorded specimen, which is preserved in Owen's College, Manchester, was captured about five miles from Rannoch, on the Pitlochry road, so long ago as 1874, and is noticed by Mr. Evans in his 'Mammalian Fauna of the Edinburgh District,' p. 23 (1892).—ED.

Hairy-armed Bat in Co. Dublin.—While shooting in the vicinity of Buckley's Hill, near Carrickmines, I observed a few large bats flying

about some trees early in the evening, and procured one specimen. It proved to be the Hairy-armed Bat, *Vesperugo leisleri*, and as it is a rare species in the British Islands, the locality is worth noting.—EDWARD C. BARRINGTON (Dublin).

BIRDS.

The "Russet-pated Chough" of Shakespeare.—May I be allowed to call attention to the word "russet" as applied to one of the oldest varieties of apple. In Miller's 'Gardener's Dictionary' (8vo edit. 1768), occurs the following:—"The Royal Russet, by some called the 'Leather-coat Russet,' on account of the deep *russet* colour of the skin," &c. Now this was a variety in Shakespeare's time, and he well knew it, for in the second part of 'King Henry IV.' Davy says, entering, "There is a dish of 'leather-coats' for you"; and Hazlitt, in his edition of Shakespeare, has the note referring to the word "leather-coat," *russetines*. Now, as everyone knows, the colour of the russet pippin is a rusty red on one side, the inference is plain that this was the colour meant by Shakespeare in the above passage, and cannot possibly mean any other colour. The term grey-russet or russet-grey, as applied to cloth, is the colour of the ordinary Welsh cloth worn by the small Welsh farmers and peasantry at the present day, and has been so worn for centuries. It exactly expresses what it is, *viz.* a rusty-brown colour streaked or rather "shot" with grey, and at a distance looks a reddish brown, the grey being only discernible when quite near. The "russet pyle," as applied to a stag, clearly means its reddish coat, as in a "pile" carpet, which is a thick-coated carpet. I think, therefore, that from Shakespeare knowing the russet pippin or "leather-coat" as well as he did, he alluded to the red feet of the Chough in the above quotation.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

[The expression "russet pyle" evidently does not apply to the deer's coat, for Turberville, who makes use of it, is describing the antlers. We have never seen a russet apple with any red on it.—ED.]

The "Russet-pated Chough."—Beyond reasonable doubt Shakespeare by this term intended the Jackdaw, and I may add—what none of your correspondents have pointed out—that in his day the very old and fine English keeping apples went by the name of *russets* from their colour, and they have no trace of red about them. As for Prof. Newton's suggestion that the red feet of the Cornish Chough, seen from beneath and against the sky, would be perceptible, I would ask who ever saw the legs and feet of a Jackdaw or Chough when flying, or indeed those of any other bird, except Storks or Herons. When a trained hawk is on the wing you may see the "jesses," but not the feet.—C. H. FISHER (The Castle, Stroud, Gloucestershire).

Birds of Prey in the New Forest.—In June last, during one of the many bright days we experienced, I saw a large hawk, at an immense height, wheeling in circles over a wood. I was inclined to believe it was a Honey Buzzard—a species I have seen here years ago—but in this case the bird was too far away to be certain about the species, and considering the scarcity of this bird, it is more likely to have been a Common Buzzard. In June also I saw a male Peregrine Falcon, which had been killed in the act of stooping at a Wood Pigeon; whilst a pair of Hen Harriers—the male in immature plumage, but of full size—and a Hobby were unfortunately killed in the same month. It is, however, gratifying to know that a pair of Hobbies nested—and I trust reared a brood—not many miles from Ringwood; but I am sorry to say one of the old birds was killed in August, after frequenting the same wood with its mate since the beginning of May. I saw a male Montagu's Harrier in the forest, and a keeper told me that a pair had a nest some two miles away—he believed the only pair in that district—but that orders for their protection had been issued, which I was glad to hear. I have since heard that the male was killed outside the forest boundary, but that the female successfully reared a brood. I also heard that no less than three pairs of Marsh Harriers had nested in the forest during the summer, though I know not in what particular locality. At the end of August two small hawks were seen flying about a large field for several consecutive days, apparently preying upon the Sky Larks, which abounded. Unfortunately, the gamekeeper was informed of it, and on the 4th of September he shot one of them, which proved to be a male Merlin, a splendid little bird. The man told me he had seen another, rather larger and not so blue in colour, which I supposed—no doubt correctly—was the female, but fortunately he could neither shoot nor trap it, although he keenly watched and waited for it. It does seem sad that the majority of notes on hawks and owls are the oft-repeated records of their destruction, and it is no wonder, therefore, that many species become rarer every year.—G. B. CORBIN (Ringwood, Hants).

Red-necked Phalarope in Anglesea.—I send you a little bird which was shot here yesterday (Oct. 5th), and which I take to be a Phalarope of some kind. It must be of rare occurrence, or we should see more of them at the period of their migration. Although resident here for some years, I do not remember to have seen another like it.—W. M. WILKINSON (Cymyran, Valley, Anglesea).

[The bird sent is the Red-necked Phalarope, *Phalaropus hyperboreus*, in winter plumage.—ED.]

Purple Gallinule in Suffolk.—While in Bury the other day I was asked to look at a "Blue Coot," which turned out, as I expected, to be one of the large Gallinules, whether *Porphyrio cæruleus* or *P. smaragdonotus*

I cannot say, but I think the latter. It was shot in a garden at Horringer, near Bury, on January 10th, 1892, and brought to a publican, who set it up very fairly and put it in a case. The legs had been painted bright sealing-wax red, with a greenish "garter," which he assured me was the right colouring. Whether the Norfolk examples of *Porphyrio smaragdonotus*, obtained in August, September, and October are genuine migrants or not this specimen, shot in mid-winter and in very cold weather, is doubtless an escaped bird, and possibly some one reading this note may remember losing a bird of this kind about the date mentioned, and may be interested to know, its fate.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Sabine's Gull in Cumberland.—Considering that Sabine's Gull has occurred a good many times on the S.W. coast of England, as also on the Welsh coast and on the N.W. coast of Scotland, I have long been puzzled to understand why it has never been hitherto met with in the N.W. of England, notwithstanding the careful description of the bird that I have placed in the hands of persons living on our coast. We have waited long for this little Arctic Gull to arrive, but not in vain. On the 30th of September last an immature female of this species was brought to me for identification by a lad who had shot it on Rockliffe Marsh, Cumberland. Whether the bird had wandered up the Solway Firth from the Irish Sea, or whether it had travelled to this estuary by the great fly-line from the coast of Northumberland, is of course difficult to decide. I lost no time in sending notices of its capture all round the N.W. coast; so that if any other specimens are secured, or even seen, we are sure to hear of them in due course. The bird in question was alone when shot; indeed it might have escaped notice altogether, had it not flown directly over the head of the gunner, who thought that it must be some kind of Tern. It will be placed (in a few months' time) in the new collection which is being cased by the Carlisle Corporation, and which will consist mainly of the collections of the late Mr. J. W. Harris and the present writer.—H. A. MACPHERSON (Carlisle).

Fulmar breeding in Shetland.—Hitherto the only nesting haunt of this bird in Shetland has been supposed to be Foula, but Mr. Trail, of Edinburgh, has ascertained that last year (1892) thirty pairs had nests on the south-westerly face of the Horn of Papa Stour. This interesting fact is announced in a recent number of the 'Annals of Scottish Natural History' (p. 184).

Tufted Duck breeding in Warwickshire.—I have never seen any recorded instance of the Tufted Duck, *Fuligula cristata*, breeding in Warwickshire; but I feel satisfied that such is occasionally the case, at any rate in North Warwickshire. On June 29th last, while watching a family party of Great Crested Grebes on a pool not very far from Coventry, my

attention was called to a very dark coloured waterfowl with a white bar on the wings, accompanied by a brood of young ones. It was obvious at first sight that the old bird was neither a Coot nor a Waterhen, and for some time I was rather puzzled as to what it could be. However, after waiting patiently for a short time, I saw the bird rise up on the water several times and flap its wings in true duck-fashion. Then the white bar became much more apparent, and the white under parts were more plainly seen. From enquiries I have made, I find that "small black ducks" have frequently been seen on the pool in question, and this supports my case. Seeing that this duck is, I believe, a permanent resident in Nottinghamshire, there is nothing very surprising to find it breeding in Warwickshire, but the circumstance may be thought sufficiently interesting to be worth noticing in 'The Zoologist.' I have been informed that Tufted Ducks have for several years past bred at Ellerton, near Newport, Salop.—A. H. ETCHES (Birmingham).

The Coot on the Hampshire Avon.—For some years past the Coot has become gradually scarcer at Ringwood and further up the river, and this not only upon waters where "pot-hunting" sportsmen are allowed to shoot, but also upon that portion of the stream which for miles is strictly preserved. I am informed, on good authority, that numbers of these birds still frequent the river lower down towards the sea, and I well recollect the time when they might almost have been reckoned "by the acre." But during the past summer scarcely a bird was seen or heard,—they generally make themselves known at the time of their clamorous courtship,—and I may safely say not a nest was built where a few years ago they were abundant. I believe the same thing has occurred at Fordingbridge and farther up the river, but I cannot conjecture why all the birds have deserted their old haunts, for although the numbers may have been augmented in the winter by arrivals from the north, yet the Coot was as truly a "resident" as its companion the Moorhen. Their disappearance has been attributed by some to illegal shooting during the "close time"; but I cannot think this illegality is carried on to such an extent as to drive away any particular species, and even if the law-breaking gunner is held responsible for its annihilation on public waters, what can be said with regard to the miles of stream that are strictly preserved, and where a shot is not fired from March until August? for the birds have disappeared from the latter as much as from the former, and if the Coots have gone from that cause alone, why not the Moorhens, Wild Ducks, and other resident species with them? In a former note I have referred to the comparative scarcity of the Pochard upon the same waters in the winter, for at the present time not one is met with where previously dozens were killed. I am well aware that some proprietors on the river are exceedingly well pleased that the Coot has thus disappeared from the upper portions of the river, for it has the

reputation of doing much harm by destroying ova and fry of all kinds of fish. My experience, however, points to the fact that fish in any stage is *not* an exclusive diet or staple article of food, and if more attention was paid to, and accurate observation made of, our feathered friends, we should find a much less number of enemies amongst their ranks than is generally supposed. Aquatic insects and plants are much oftener found in the stomach of this species than any fish remains, and even if an occasional fish is indulged in, surely it need not be grudged from the abundance at hand. I very much hope these birds will return again to their old haunts, and with their summer note of "krew—krew," build their nests and rear their broods. If not, the bird-lover as he wanders along the banks of the old Avon, will have lost one source of pleasure in the absence of the comparatively shy and retiring, but nevertheless active and vigilant Coot.—G. B. CORBIN (Ringwood, Hants).

Goldfinches breeding in Captivity.—The opinions generally expressed on this subject are so conflicting, and in the main adverse to a satisfactory result, that my experience may have some interest to those who study such matters. Mr. A. H. Greene says, "The males might pair with Canaries and produce mules, but the females are not at all likely to breed in captivity." Dr. Karl Russ, in his list of birds which will breed in captivity, omits the Goldfinch, as though it were quite out of the question. In spite of these difficulties, I determined to make the experiment. In 1891 I attempted to get my birds to pair, but they did not even build a nest. I tried again this year, and this is how I managed:—I put a Russian male and a German female Goldfinch, which I had had about two years, about the end of May, in a London breeding-cage, and placed them in a quiet room. The hen laid her first egg on the 1st of June, and laid one every day afterwards until the full number (five) was deposited. She sat on them for fifteen days, but without result. At the end of about a week she again commenced laying, missed a day, and then continued until five were in the nest. She had sat ten days, when I looked in the nest and saw that two young birds were hatched. She did not seem to notice them, but began to sit on the remaining three eggs. I put near the nest some egg chopped fine and bread-crumbs. I then moved her off the nest, and, after waiting some time, closed the door. She then appeared to understand what was expected of her, and commenced feeding them, and then went on sitting on the eggs. Next day two more young birds were hatched, the remaining egg proving addled. In a fortnight the young had a good many feathers, and in time they all got out of the nest. I think they are hardy birds, for when I went for my holidays I took them with me to Somersetshire, stopping first at Oakhill, near Bath, and then at Locking, near Weston-super-Mare, and from there returned to my home in London, but they were not affected by the journey. Whilst the old Gold-

finches were breeding I fed them on canary-seed, soaked rape-seed, and Hartz-Mountain bread, as well as on egg and soaked bread.—E. BENNETT (Romanhurst, Highgate, N.).

Ornithological Notes from the Lake of Lucerne.—A few remarks on the result of my experiences at Brunnen, on the Lake of Lucerne, during the month of July last, may perhaps be acceptable to readers of 'The Zoologist.' This beautiful neighbourhood possesses two great advantages for the lovers of birds—the avifauna is decidedly rich, and the locality easy of access. I observed sixty-three species during the month of July, although the weather was somewhat unfavourable, for we had some days of excessive heat, followed by thunder-storms, and then more than a week of heavy rain. The four most noteworthy birds were the Wall Creeper, *Tichodroma muraria*, the Crag Martin, *Cotyle rupestris*, the Marsh Warbler, *Acrocephalus palustris*, and Bonelli's Warbler, *Sylvia bonellii*; but besides these there were many other interesting species, such as the Black Kite, *Milvus ater*, and the Crested Tit, *Parus cristatus*, which was plentiful everywhere. The great rock called the Axenstein, which rises to a height of about 2400 ft., forms with its slopes and terraces a splendid observatory, and earlier in the season would have been a still richer field for the ornithologist. Mr. Warde Fowler and Mr. Playne accompanied me there on July 10th, and they were greatly pleased with the evidence of bird-life around us. From the Axenstrasse, that magnificent road which leads from Brunnen to Pluelen, I was fortunate enough to observe the Wall Creeper ("Mauerspecht," as it is there called) on the rocks above. Mr. Algernon Harris, of Dublin, who accompanied me, had first noticed it on the rocks below, where he saw it creeping upwards from the margin of the lake, peering into all the cracks and crevices as it went, and pausing from time to time to devour with much satisfaction what insect-food it found therein, and then flying down again to the water's edge. When I saw it first it had mounted the rocks above the road, and gradually pursued its erratic course until out of sight. The exact spot where we observed it was on the Axenstrasse, just beyond the celebrated Tunnels, about a quarter-of-an-hour's walk from Tell's Chapel. I had intended to go far afield to look for this most interesting bird, and was charmed to find it so near at hand. Herr Shaeck, of Brunnen, told me that it came closer up to the village, and that in winter it had even entered his house. Around these well-known tunnels great numbers of Crag Martins pursued their almost ceaseless flight, and their resting-places were readily discernible in the rocks above. A few House Martins were mingled with them, but the Crag Martins were greatly in the majority. We did not anywhere see a Sand Martin, but on two occasions we noticed the Alpine Swift, *Cypselus melba*. Amongst his dusky congeners the Marsh Warbler, *Acrocephalus palustris*, was observed hard by in all the ponds and streams in the neighbourhood, and especially along

the banks of the Muotta. It has a sweet song of its own, and almost unrivalled powers as a mocking-bird. I heard it imitate the Nuthatch, Wagtail, and other birds with wonderful accuracy. Bonelli's Warbler was quite common in all the woods; it is indeed the Warbler *par excellence* of Brunnen. In appearance it resembles the Wood Warbler a good deal, and its note, which is repeatedly uttered, also reminds one of that bird; it is certainly one of the poorest songsters amongst all the Warblers. There were several birds common in England which we failed to find near Brunnen, notably the Sky Lark, Greenfinch, Jackdaw, Rook, Sand Martin, and a few others; on the other hand, we had the Cuckoo, Corn Crake, and Quail, infrequently met with elsewhere. On the whole, I think it would be very difficult to find a district more likely to reward the observant ornithologist than this, especially if he were to arrive in May or June; and in this opinion Mr. Fowler, from his brief survey of the locality, quite agreed. I was sorry that he and his enthusiastic young friend Mr. Playne were only able to spend two days in the neighbourhood. At Brunnen we noticed some large vipers, one of which seemed to be fully two and a half feet long, and it bit savagely at my companion's stick. On one occasion a Weasel ran out from the grass on the side of the road, and running over to my friend George P. Farran, who stood perfectly still, it planted its two fore paws on his trousers, and then, turning round, ran on before us, frisking hither and thither like a kitten, with its tail in the air.—CHARLES W. BENSON (Rathmines School, Dublin).

Partridges Migrating.—Have any of your readers observed Partridges migrating? In 1889 there was an unusual number of coveys here. I left a full stock, hoping for an increase the following year. Late in 1889, about November 31st, I saw on a road near here a very large number of Partridges. They went off towards the hills to the south-west. About two miles further on the same road I saw another large pack, which flew off in the same direction as the others. Since then I have had very few. In 1889 several coveys appeared in my fields which were certainly not there at the beginning of the season, and which I believe must have come from a distance.—MATT. WELD O'CANNON, Baltrasna, Oldcastle).

[Something of the same sort has been observed in the case of Grouse. See Clarke and Roebuck, 'Handbook of the Vertebrate Fauna of Yorkshire,' p. 62.—ED.]

American Red-breasted Snipe in Ireland.—On the 29th September last I obtained a bird of this species, which had been forwarded to the Dublin market, together with a lot of Common Snipe, from Maryborough, Queen's County. The specimen proved to be a female in the immature plumage of autumn, and is the first time this species has been known to occur in Ireland.—E. WILLIAMS (2, Dame Street, Dublin).

Solitary Snipe in Co. Mayo.—A specimen of this rare visitor to Ireland was shot on October 13th by Mr. T. L. Mason, at Ballycrooy, Co. Mayo. On dissection, the bird proved to be a female in good condition, weighing seven ounces. This is only the fifth occurrence, so far as ascertained, of this species on the west coast within the last few years.—E. WILLIAMS (2, Dame Street, Dublin).

The Cormorants in St. James's Park.—Though late in the day to make the request, I venture to ask you, if you can, to spare a corner in your columns to place on record the fact—unnoticed hitherto, so far as I am aware, in any public print—that the captive Cormorants bred this year for the first time in St. James's Park. The birds were brought from the Megstone Rock, the most northerly of the group of the outer Farne Islands, in 1888, a few weeks after the visit of a fine, apparently wild, Cormorant, in full adult plumage, to London waters had been noted in 'The Times.' Neither their appetites nor their digestions suffered by the change from the bracing air of Northumberland, and a day or two after their arrival one of the party, at the time barely two-thirds grown, after swallowing a couple of haddocks, bolted a full-sized rat, just killed and dropped accidentally near it, and at once opened its beak to ask for more. They showed no signs of breeding until 1892, when a pair, then in their fifth year, took possession of a nest which had been prepared for them, and one egg was laid. Under natural conditions a Cormorant's egg is strong-shelled, and so thickly coated with lime as to look often less like a real egg than a carelessly-cut model in chalk. The last year's egg was thin-shelled, and so brittle that it broke under the weight of the bird. The keeper, gathering from this that more tonic food was needed, has this year, when feeding the birds, powdered the fish with pounded shells. The experiment has proved successful, and late in the season two satisfactory eggs were laid, one of which was hatched about the end of the first week of September, some two or three months behind the usual hatching time of the species. The nestling has been devotedly tended by both parents, who have until very lately fed it regularly from their own crops with half-digested fish, and so closely brooded it that it has seldom been possible to see it without disturbing them. To the usual perils of infancy has been added in this case an invasion of the corner of the lake railed off for the use of the Cormorants by a couple of White Swans, who, "like eagles in a dove-cote," fluttered the old birds and drove their charge from the nest. But all have been safely passed; and, in spite of its unseasonable arrival, the young bird, as I saw it yesterday, is well grown and healthy, and promises, before winter sets in in earnest, to be strong enough to struggle effectively for existence on its own account.—T. DIGBY PIGOTT (5, Ovington Gardens, S.W.).—*'The Times,'* Oct. 25th.

[Some years ago a pair of trained Cormorants which had been tem-

porarily deposited by their owner, Capt. F. H. Salvin, at the Gull-pond in the Zoological Gardens, Regent's Park, nested there, and a young one was hatched and reared.—ED.]

Short-eared Owl in Hampshire in Summer.—Some eight years ago (Zool. 1885, p. 434), I called attention to the occurrence of this species upon an extensive heath-land in south-western Hants in the month of May. During the past very hot and dry summer I was informed that two birds of the same kind frequented the same heathy moorland. I gave little credence to the report at the time, but at the end of July one was killed, and on the 24th of August another was caught in a pole-trap. The former was very pale in colour, possibly a female, beside being much mutilated and decomposed; but the latter was a dark-plumaged male in good condition and perfect feather. I am not prepared to say that either of these were the birds reported in the earlier part of the season, but their occurrence upon the dates named is very early for this locality if they were migrants. I have been unable to obtain any evidence of the species nesting in the neighbourhood. Although this bird usually rests on or near the ground, and seldom settles on the branch of a tree, yet the situation in which the male was secured (namely, in a pole-trap) is a proof that it avails itself—at least occasionally—of an elevated perch, and in this case, were it not for the trap, it might have proved an advantageous “look-out” from which to watch for prey. On dissection, I found no mammalian remains in the stomach, but an almost entire carcase of a hedgesparrow and the head and legs of a “titlark,” together with a few small larvæ, and fragments of Coleoptera, the latter possibly from the stomachs of the small birds. The robust and well-conditioned body indicated that the bird in question had provided itself with a sufficient supply of food, wherever it might have fared, and in this respect it differed from the general appearance of migrants on their first arrival, especially if the journey was a long one. Whilst on the subject of Owls, it may be of interest to note that during the past summer I knew of two localities, some miles apart, where Long-eared Owls successfully reared a brood, and in one instance I had the pleasure of seeing an old bird feeding two fluffy youngsters as they sat upon the branch of a tree, looking almost like two balls of grey down. They were being regaled upon fragments of Yellow Bunting.—G. B. CORBIN (Ringwood, Hants).

FISHES.

The Tunny in the Solway Firth.—When engaged in preparing a report on the fishes of the Solway Firth for embodiment in the ‘Fauna of Lakeland,’ I was unable to decide whether the Tunny, *Oreynus thinnus*, should or should not be included. William Borrowdale, of Glasson, one

of the oldest fishermen on the firth, assured me, about ten years ago, that he had met with one or two Tunnies during the previous fifty years; but I could obtain no conclusive evidence on the subject. I have now the pleasure of stating that the Tunny does, at least occasionally, visit the N.W. coast of England, having received a fresh specimen, captured near Silloth in August last.—H. A. MACPHERSON (11, Victoria Place, Carlisle).

Lesser Fork-beard in Plymouth Sound.—On September 12th I caught in a trammel-net, in Plymouth Sound, a specimen of the Lesser Fork-beard, *Raniceps raninus* (Day); also, on Sept. 20th, a Red Mullet, *Mullus surmuletus* (Day), off the Cornish coast, measuring 17 in. long from tip of nose to tail, 10½ in. in girth, and weighing 2 lbs. 6 oz.—H. L. POPHAM (Royal Western Yacht Club, Plymouth).

[The Fork-beard, which frequents the coasts of Northern Europe, extending to the south coasts of England and Ireland, is not very frequently met with, but several instances of its capture have been recorded from time to time in 'The Zoologist.' For example, on the Norfolk coast (Zool. 1844, p. 532, and 1846, p. 1264); in Mount's Bay, Cornwall (Zool. 1863, p. 8642), where in 1864 three more were captured, and in 1866 two; at Penzance in 1872 (p. 2947), 1876 (p. 5128), and 1878 (p. 109). As regards Devonshire, a specimen in Mr. Rowe's collection was taken some years ago at Plymouth. Mr. Ogilby observed (Zool. 1876, p. 4903) that the curious fact of this fish being generally washed ashore dead tended to prove that it lives in very deep water, where neither nets nor lines can be used, and where perhaps it is not so rare as is supposed.—ED.]

Bonito in the River Dee.—Mr. McKie, hon. curator of the Kirkcudbright Museum, has kindly furnished me with particulars of the recent capture of this rare fish in a salmon-net at the mouth of the Dee. It is being mounted for the Museum, which already contains a more than ordinary collection of well-mounted fish. This is only the third record of the Bonito in local waters, so far as I am aware. One was caught at the Bowes Scaur on July 25th, 1831. Another was captured on July 22nd, 1842, near to Caerlaverock Castle, and was sold in Dumfries. Since then I am not aware of any other instances of the capture of this species in or near the Solway.—R. SERVICE (Maxwelltown, Dumfries).

CEPHALOPODA.

Rossia Oweni on the Anglesea Coast.—When staying at Rhostreigir in May, 1892, I obtained an example of this Cephalopod, which had been picked up on the beach in Cymmeran Bay in the preceding winter. Mr. W. E. Hoyle has kindly identified the specimen (a female), which is now in the Owen's College Museum, Manchester.—CHAS. OLDHAM (Ashton-on-Mersey).

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 4, 1893.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. Arthur Ernest Gibbs, F.L.S., of The Hollies, St. Albans, was elected a Fellow of the Society.

Mr. F. Merrifield exhibited specimens showing the effects of temperature in the pupal stage on several species of Lepidoptera. *Vanessa polychloros* was much darkened, especially towards the hinder margin, by a low temperature. *Vanessa c-album* showed effects on both sides, especially in the female; they were striking on the under side. Several examples of the striking effect produced by temperature on the summer emergence (*prorsa*) of *Araschnia levana* were exhibited. Some *Vanessa io* showed the gradual disintegration, by exposure to a low temperature, of the ocellus on the fore wing, which in the extreme specimens ceased to be an ocellus, and was a remarkable confirmation of Dr. Dixey's views of the origin of that ocellus, as exemplified in the plate attached to his paper in the Entomological Society's Transactions for 1890. Mr. Goss stated that in his experience of *V. c-album* in Northamptonshire, Gloucestershire, Herefordshire, and Monmouthshire, the form with the pale under side was the first brood, occurring in June and July; and that the second brood, occurring from the end of July to October, was invariably dark on the under side. Mr. Jacoby, Mr. Merrifield, and the President continued the discussion.

Mr. A. H. Jones exhibited Lepidoptera collected in Corsica in June last, including dark forms of *Polyommatus phlæas* (Vizzavona); *Lycæna astrarche*, in which the orange marginal band is very brilliant on upper and under sides of both wings (Vizzavona); *Lycæna argus*, the females of which are much suffused with blue, probably var. *calliopis*; a series of *Vanessa urticae* var. *ichnusa*, bred from larvæ found at Vizzavona (4000 feet); *Argynnis elisa*, *Satyrus semele* var. *aristæus*, *Satyrus neomiris*, *Cænonympha corinna*, both spring and summer brood (Vizzavona); *Syrichthus sao* var. *therapne*, and many others.

Mr. G. C. Champion exhibited, for Mr. G. A. J. Rothney, a number of *Methoca ichneumonoides*, Latr. (female), taken at Bexhill, Sussex, showing great variation from the usual large black and red form to a small and nearly-black one.

Dr. D. Sharp exhibited a pupa of *Galleria melonella*, on which the eggs of a parasitic Hymenopteron, as he believed, had been deposited while the insect was in the cocoon. He also exhibited, from the collection of Alexander Fry, Esq., the hitherto unique *Aprostoma planifrons*, Westw. The genus was correctly assigned by Westwood to the *Colydiidæ*, though described as a Brenthid.

Mr. J. J. Walker exhibited the following species of *Halobates*, viz.:—*H. sericeus*, Esch., from the Pacific; *H. sobrinus*, B. White, from Marquesas Islands; *H. wüllerstorffi*, Esch., from Marquesas Islands; *H. princeps*, White, from the China Sea; and a female of *H. wüllerstorffi*, with ova attached.

Mr. W. H. B. Fletcher showed a variable series of seventy-five *Cymatophora or*, bred in 1893 from larvæ from Sutherland, a series of about forty *C. ocularis* bred-in from stock from Oundle. Also a series of thirty-three moths, all females, supposed to be hybrids between *C. ocularis* male and *C. or* female, from the above stock in each case, bred as a second brood in August and September, 1893. He stated that he placed the reputed parents in a muslin sleeve on a branch of *Populus nigra*, and did not open the sleeve until the resulting larvæ required fresh food. To the best of his belief the female parent had no chance of pairing with a male of her own species. The supposed hybrids resembled the female parent, except that both orbicular and reniform stigmata were very conspicuous, being pure white filled up slightly with black, whereas in *C. or* they are usually inconspicuous and the orbicular are sometimes wanting. None of the *C. or* bred had the stigmata developed so fully as had the hybrids, which were most uniform in this respect.

Mr. F. J. Hanbury exhibited a specimen of *Leucania vitellina*, taken at Brockenhurst on August 24th, 1893, by Mrs. Hanbury, and another taken by himself at Freshwater, Isle of Wight, on September 7th; also an extraordinary *Gonepteryx rhamni*, showing red blotches at the tips of the fore wings, taken by a gardener at Walthamstow, Essex.

Mr. C. G. Barrett exhibited a gynandrous *Argynnis paphia* recently taken in the New Forest by Mr. Cardew.

Mr. J. M. Adye exhibited a specimen of *Deilephila livornica* recently caught at Christchurch, Hants.

Mr. Elwes exhibited and described two species of the genus *Eneis* (*Chionobas*, Bdv.), *E. beani* and *E. alberta*, from North America, which had not been previously described, and stated that he had prepared, with Mr. Edwards's assistance, a revision of this very difficult genus, which would be read at the November meeting.

Mr. Osbert Salvin communicated a paper entitled "Description of a new genus and species (*Baronia brevicornis*) of *Papilionidæ* from Mexico," and exhibited both sexes.

Dr. Sharp read a paper entitled "On the Cost and Value of Insect Collections." Mr. W. F. H. Blandford, Mr. McLachlan, Mr. Jacoby, Mr. Waterhouse, and the President took part in the discussion which ensued.

Professor Auguste Forel communicated a paper entitled "Formicides de l'Antille St. Vincent, récoltées par Mons. H. H. Smith."

Mr. W. F. H. Blandford read a paper entitled "Description of a New Subfamily of the *Scolytidæ*." The President, Mr. Jacoby, and Mr. Waterhouse took part in the discussion which ensued.

October 18.—HENRY JOHN ELWES, Esq., F.L.S., F.Z.S., President, in the chair.

Professor C. H. Tyler Townsend, of the Institute of Jamaica, Kingston, Jamaica, was elected a Fellow of the Society.

Mr. R. Adkin exhibited two *Leucania vitellina* and one *L. extranea*, taken by Mr. B. W. Adkin in the Seilly Islands, in August, 1893.

Mr. R. South exhibited a specimen of *Polyommatus beticus*, and a number of varieties of *Chrysophanus phlaas*, captured in Kent, in September last, by Mr. Sabine; also a curious variety of *Argynnis euphrosyne*, taken in Lancashire in May, 1893, by Mr. T. Baynes; a pallid variety of *Vanessa urticae*, taken by Mr. W. E. Cox in Monmouthshire, in July, 1893; and a *Triphana pronuba*, the right wings of which were typical, and the left wings resembled the variety *innuba*, caught at sugar, in Dovedale, Derbyshire, by Mr. Blagg, in July, 1893.

Mr. G. H. Verrall exhibited a specimen of the Tsetse (*Glossina morsitans*), and also one of the common European allied species (*Stomoxys calcitrans*). He also exhibited a specimen of *Hamatobia serrata*, Dsv., which he stated was not uncommon on cattle in England, but believed to be harmless; while in North America the dreaded "horn-fly" is said to be the same species.

Mr. Elwes exhibited a larva which he had found three days previously under stones on a moraine, apparently quite destitute of vegetation, in the Tyrol, at an elevation of about 7000 feet. He remarked on the number of Alpine butterflies, some of them in fresh condition, which he had seen whilst chamois-hunting in the Tyrol during the last week, and he suggested that in such a fine autumn as the present one collectors might find more novelties among the larvæ of Alpine species than in the summer.

Colonel Swinhoe read a paper entitled "A list of the Lepidoptera of the Khasia Hills" (Pt. 2). Mr. Elwes said he thought all entomologists would be grateful to Colonel Swinhoe, Mr. Hampson, Mr. Meyrick, and others, for the work they had recently been doing in describing the moths of India; but as the district of the Khasia Hills was probably richer in species than any other part of India, except Sikkim, and new species were being received almost daily, it was impossible to make any list complete. Mr. Jacoby, Mr. McLachlan, Mr. Jenner Weir, and Colonel Swinhoe continued the discussion.

Mr. E. Meyrick communicated a paper entitled "On a Collection of Lepidoptera from Upper Burma." The author stated that the species enumerated in the paper were collected by Surgeon-Captain Manders whilst on active service in the Shan States and their neighbourhood, shortly after the British annexation of the territory. A discussion followed, in which the President, Surgeon-Captain Manders, and Colonel Swinhoe took part.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Zoology of the Invertebrata: a Text-book for Students. By ARTHUR E. SHIPLEY, M.A. 8vo, pp. viii & 458. London: Adam & Charles Black. 1893.

THANKS mainly to the rise of the Cambridge school of biologists, English students are now able to obtain suitable textbooks written with a knowledge of their needs, and doing justice to English workers. Mr. Shipley's new book comes well in this category, and supplies a distinct want of students for honours in elementary zoology, or a pass at degree examinations. He has wisely omitted detailed descriptions of those selected types that are to be found in more elementary text-books, and has chosen other types for full description, thus materially aiding the student. His definitions are good and full, his descriptions clear and useful, his tables well arranged. Few omissions of consequence are noteworthy, remarkable exceptions being the Rotifers, whose morphological importance is immense, and *Phoronis*. Here and there we have noted slight blemishes, the citation of which in a review would give them a disproportionate and undue prominence. Rather more serious is the description of the "nauplius eye" as a "simple eye" when its triple nature is unmistakeable, and the omission to note the presence of the "entosternite" in Crustacea, as first shown by Prof. Lankester. The reviewer is pleased to note the acceptance of his views on the importance of anal respiration in this group. Indeed in every respect the work is well up to date.

The get up of the book is very good; binding, type, and illustrations are equally creditable to the publishers. But the paper is far too stout: the 'Century' magazine is a standing proof that paper scarcely half as thick is sufficient to do justice to printing and woodcuts; and bulk and weight are serious disadvantages in a text-book intended and surely destined for frequent use. We regret to see the un-English spelling "development" throughout the book—a spelling which somehow brings to our mind a suggestion of Gretna Green.

M. H.

